View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by SZTE OJS Journals (University of Szeged / Szegedi Tudományegyetem)

# HELICICULTURE AS A TOOL FOR RURAL DEVELOPMENT IN SOUTHERN TRANSYLVANIA

**VOICHITA GHEOCA[1], LETIȚIA OPREAN[2]**

[1]"Lucian Blaga" University of Sibiu, Faculty of Sciences,
[2]"Lucian Blaga" University of Sibiu, Faculty of Agricultural Sciences, Food Industry and Environmental Protection,
5-7 Dr. I Raţiu St., RO – 550012, Sibiu, Romania
vgheoca@yahoo.com

**ABSTRACT**
In Romania there is no tradition as regards the consumption of snails. After several decades of land snails populations' exploitation for international trade, in the last decade the farming of edible snails has evolved in Romania. The expansion of this practice was encouraged by the SAPARD Program and several foreign companies, promising a quick and easily obtained benefit. About 650 snail farms were established in Romania between the years 2004-2008, most of them using the Italian method, with *Helix aspersa* in pastures. However, this method had proved its deficiency in the given environmental conditions, leading to high mortality rates. An autochthonous method was developed using *H. pomatia*, applied by farmers organized in a cooperative, and which have invested in their own processing factory in southern Transylvania, aiming to obtain valuable biologic products. Both the individual farmers and the cooperative were not able to sustain the losses registered during the first years, and find a market for their products, a situation that lead to the collapse of heliciculture in Romania. Despite the unfortunate experience, this new agricultural activity has the potential of a profitable practice in Romania, and especially in Transylvania, not just due to the demand of the European market, but also to the climatic conditions, which make possible the snail farming. Choosing the appropriate technology and species could allow the development of profitable businesses in the rural areas, which could serve as alternative to the exploitation of *Helix pomatia* natural populations.

**Keywords**: Heliciculture, snail farming, alternative production, rural development, Southern Transylvania.

## INTRODUCTION

In the last years the field of agriculture was extended with new nontraditional alternative productions, which respond to the European market demands. This is the case of heliciculture, which was extended during the last decades beyond its traditional areas. The term "heliciculture" originates from Latin and signifies the productive process of growing edible land snails in captivity, in outdoor or indoor farming systems.

Although the term was just recently popularized, it refers to a practice with ancient roots, snails being part of human food since prehistoric times, as shown by the abundance of shells in many archeological sites (LUBELL, 2004). The Greeks, Phoenicians, and other pre-roman Mediterranean cultures ate land snails, practice conserved until today in the Mediterranean cuisine (DUHART, 2009). In ancient Rome the snails were fatten with flour, aromatic herbs and wine in so named "cochlear gardens". During the expansion of the Roman Empire, the use of snails has also extended as far as its boundaries. The European Middle Age brought a new significance for the consumption of snails, in convents their meat being allowed during the fast. In the 19th Century, snails are introduced in America, Africa and some Asian countries.

Snails were valued over time not just for their taste and nutritional properties, but also for numerous therapeutic or biological properties (BONNEMAIN, 2005). Pliny thought that snails increase the speed of delivery, and recommended their use to treat pain related

to burns and abscesses. Trough time, various snail preparations were used for different purposes, starting with snail extracts used for dermatological disorders, symptoms associated with tuberculosis and nephritis and ending with helicidine, a bronchorelaxant drug (PONS et al, 1999), or HPA lectine used as a marker in several types of cancer (THIES et al, 2001).
In Romania there is no tradition concerning the consumption of snails. At the beginning of the 20th Century the affinity with the French culture led to the takeover of some culinary habits. Thus, the famous “escargot” was sold in the groceries from Bucharest, being brought from Transylvania or Banat. Today, the biggest consumers of this culinary delicacy in Europe are France, Italy, Spain, Germany, and Austria. Only in France the consumption of snails is evaluated to over 35.000 tones/ year, over 90% of this amount originates from Eastern Europe and the Mediterranean countries.
The culinary success of the famous "garden snail" caused an overexploitation which, associated with the degradation of suitable habitats due to land use and pesticides, determined a decline of the natural populations in some countries from Western Europe. That is why *Helix pomatia* was included in the Red Lists of several countries, being forbidden its collecting from the wild. *Helix pomatia* is also part of the Bern Convention's list, Appendix III, concerning the vulnerable animal species whose exploitation is the object of a management. This is one of the reasons why the harvest of land snails from their natural habitats was progressively replaced in West European countries by the breeding of these animals, a practice which was extended during the last decades also in some East European countries.
This paper aims to analyze the potential of heliciculture in southern Transylvania, as a tool for rural development in the context of this practice’s evolution in Romania.

## MATERIAL AND METHOD

In order to investigate the evolution of the land snail breeding activity in Romania, it was analyzed the data available at Ministry of Agriculture and Rural Development, County Directions for Agriculture and Rural Development, Payment Agency for Rural Development and Fishing. An analysis of applicability for different technologies used in snail farming was made. Further information was acquired from the snail processing units, current and former snail farmers.

## RESULTS

### General aspects

In Romania, the farming of edible snails has evolved in the last decade and especially during the period 2004-2008, when many agricultural producers were attracted by the idea of getting almost immediate benefit with little investment and no much technical effort. The mirage of getting rich was supported by several foreign companies, advertised by the National Agency for Agricultural Consulting. The Italian companies have signed contracts with the farmers, thus the companies supplied the breeders and the technology, by the other hand, the farmers delivered their products. Theoretically these contracts should have brought benefits for both parts, but often the quality of breeders wasn’t the promised one, their price was enormous, and the technology not adapted for the local conditions. Also, frequently the companies did not buy the snails from the farmers as contracted. As expected, the result was, after a boom of this practice, an identically quick collapse of it.

**Financial issues and agricultural policies**

The establishment of a snail farm does not represent a major investment, and an amount of 10 000 Euro is generally considered suitable for a 2000 $m^2$ farm. This is one of the reasons why many people in Romania were attracted by this apparently great business. The expansion of this practice in Romania was encouraged by the SAPARD Program, dedicated to support the efforts being made by the Central and East European applicant countries in the pre-accession period as they prepared for their participation in the common agricultural policy and the single market. A number of seventy snail farms all over the country were financed by this program, with a total amount of over 320 000 Euro. *Table 1* presents the distribution of the financed projects by county, as well as their value.

**Table 1. The distribution of the SAPARD financed snail farms in Romania and the value of the founding for each applicant county**

(source: the Ministry for Agriculture and Durable Development, Payment Agency for Rural Development and Fishing, http://www.apdrp.ro.)

| County | No of farms | Value in Euro | County | No of farms | Value in Euro |
|---|---|---|---|---|---|
| Alba | 1 | 12.439,69 | Iasi | 2 | 29.272,58 |
| Arad | 6 | 37.130,70 | Ilfov | 4 | 26.237,16 |
| Arges | 2 | 15.746,62 | Maramures | 2 | 16.193,99 |
| Bacau | 3 | 22.508,34 | Mehedinti | 1 | 7.097,42 |
| Botosani | 4 | 70.602,20 | Olt | 3 | 57.781,42 |
| Braila | 2 | 14.486,13 | Satu Mare | 1 | 11.112,06 |
| Caras-Severin | 3 | 9.522,74 | Salaj | 3 | 25.646,83 |
| Calarasi | 1 | 3.546,54 | Sibiu | 5 | 53.309,49 |
| Constanta | 1 | 20.335,77 | Suceava | 4 | 42.404,76 |
| Dambovita | 1 | 3.010,63 | Teleorman | 1 | 2.870,72 |
| Dolj | 4 | 19.069,93 | Timis | 3 | 16.430,66 |
| Giurgiu | 1 | 11.466,69 | Vaslui | 1 | 12.733,77 |
| Gorj | 7 | 41.055,67 | Valcea | 2 | 22.491,88 |
| Hunedoara | 1 | 8.628,83 | Vrancea | 1 | 27.010,91 |
| | | | | | Total value of the 70 farms founded: **321.321,05** |

The mentioned seventy farms were established during the period 2005-2006, the peak of the snail farming trend in our country. Obviously, this number constitutes just a small fraction of the total number of farms developed in Romania, which is estimated at about 650. Unfortunately there is no reference about the total number of farms ever existent in Romania. The data concerning this practice are divided between several national agencies and registers, whereat the farmers were interested to register. Under the law 166/2002 concerning the agricultural exploitations, each farmer had to register as agricultural operator into the Register of Agricultural Exploitations, but just a small number of farms (about 40) were registered here. More of them (92) were registered on the List of Operators in Ecologic Agriculture, certificate which allowed the farmer to sell his product toward the biologic products processing factories. The *Figure 1* present the number of ecologic snail farms by county, as registered in 2008. The largest number of certified ecologic farms is registered in the counties from south of Transylvania: Brașov – 32 farms, Covasna – 13, Sibiu – 8 and Alba -5. This situation, although incomplete, underlines the potential of the

area, both in terms of suitable environmental conditions and receptivity of small businessman towards this alternative agricultural production.

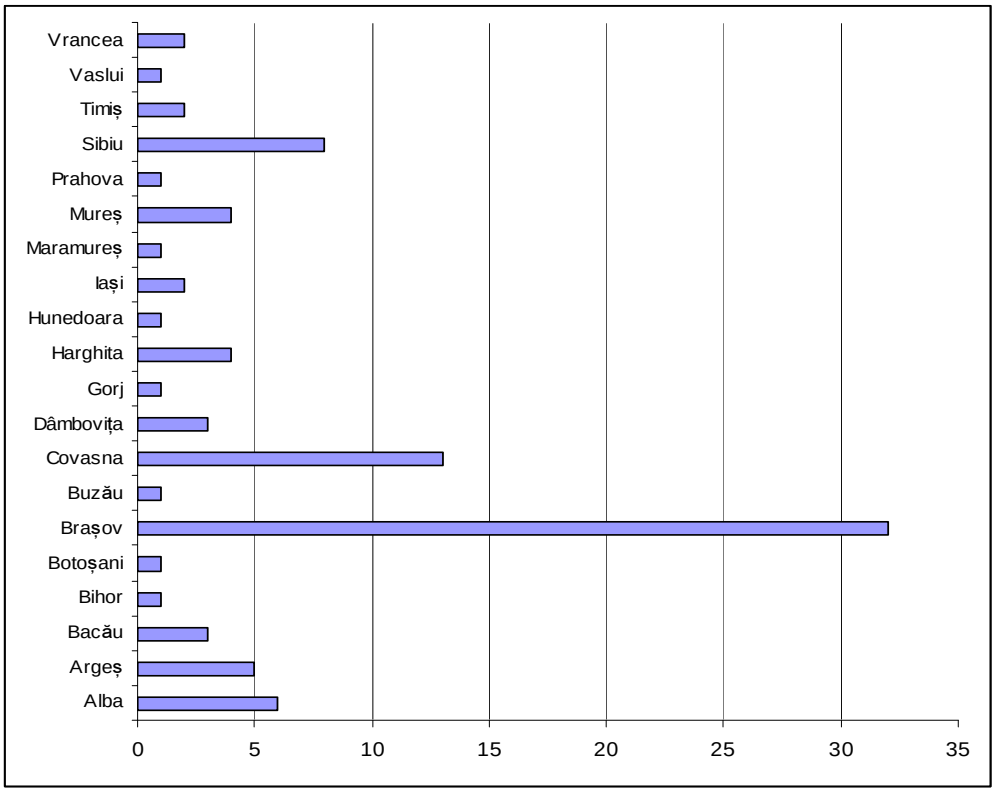


**Figure 1. The number of ecologic snail farms by county, registered in 2008**
(source: Ministry of Agriculture and Rural Development – The list of operators for ecologic agriculture)

**Climatic conditions and more or less adapted technologies**

Southern Transylvania is featured by the climate regime of Transylvanian Plateau, a continental climate, heavily influenced by the predominant western oceanic circulation, by the protected position provided by the Carpathians and by local conditions. The yearly thermic amplitude varies between 21–23.5°C. The multiannual means of temperature decreases from +8,6 - +9 $^{o}$C in the depressionary and plateau area to +4.3 $^{o}$C – +2 $^{o}$C in the mountains. The monthly multiannual means of temperature fluctuate between -4.4$^{o}$C in January (Sibiu) and +19.5$^{o}$C in July. The absolute values of temperature recorded in the depressionary submontaneous area (at Sibiu Station) were about –31.8$^{o}$C (23$^{rd}$ of January 1963) and +37.5 $^{o}$C (25$^{th}$ of August 1997). The precipitation regime is characterized by the increase of values with altitude, with more prolonged regime of precipitations in spring – summer period. The multiannual means of precipitations vary between 650–750 mm in the depressionary areas and between 900-1200 mm in the mountains. The monthly averages of precipitations vary between 85–102 mm at Dumbrăveni, 76–100 mm at Sibiu, 150–200 mm at Păltiniş. The thermic values and the level of precipitations are favorable for the development of *Helix pomatia,* the single edible land snail species naturally present in the area, equally collected in the wild and farmed. *Helix pomatia* is also often preferred to *H. aspersa* for its flavour and its larger size. The latest one, *H. aspersa* (*Cornu aspersum*) is native to the Mediterranean region including North Africa and probably the Atlantic coastal regions from Portugal to the Netherlands and the British Isles. It was introduced to Greece and Asia Minor in classical times (e.g. KERNEY et al. 1983, MIENIS 2007). It is the most common species used in heliciculture, due its adaptability to different climatic conditions and is known as the only species which may be raised in closed artificial conditions. This plasticity is the reason of its introduction, during the last few decades,

round the world (e.g. PICKERING, 2009, JUŘIČKOVÁ and KAPOUNEK, 2009, MIENIS, 2007, SANDERSON and SIRGEL, 2002, BARKER, 1982).
A number of 475 farms were established in Romania using the Italian technology – the Cherasco method – with *H. aspersa* breeding in completely outdoor conditions, with fresh plant diet or with supplement of dry fodder. The Italian method that uses *Helix aspersa* with outdoor hibernation, was a failure for the Romanian farmers, which sometimes encountered a mortality of 80-90% for *H. aspersa*, due to the low temperatures in winter.
A more appropriate technology for our climatic conditions seems to be the use of *Helix pomatia*, a species more adapted for hostile winter conditions, and who can bury in winter even at one meter depth. The inconvenient is that *H. pomatia* is a slow grower, it needs 2.5-3 years to reach the exploitable size, and is more sensitive. An autochthonous method to raise *H. pomatia* is known as Teliu method, and is an adaptation of Cherasco method to *H. pomatia*, with a possibility of harvesting throughout the year.

**A more beneficial activity – meat processing**
A consequent further stage in the snail growing practice in Romania was the transition from the marketing of living snails, towards much valuable processed products. Several small processing units were established during the last decades, the three most important of them are located in South of Transilvania: *Pomarom* Alba Iulia, established in 1993, *Rolux* Hateg established in 1999, and *Escar Prod* Teliu, in 2005. The first two were conceived for the processing of the snails harvested in the wild, and their activity was extended as the new practice raised, while the last one, *Escar Prod* Teliu, was designed as a cooperative of 220 snail growing farmers from the entire country. Organized in 2005, the cooperative has started in the snail growing business with the idea of obtaining an organically certified product, worthy of international marketing. They have established a reproduction and growth method for *Helix pomatia*, a free range method to reduce the stress factor and to insure a well balanced diet, within the parameters of certifiably organic agriculture, known as Teliu method, as mentioned before. During the first two years of their activity, the farmers were able to insure the raw material necessary to the production of over 1000 tones/year of finished product. *Escar Prod* was a modern processing plant, built to the latest standards of food products handling and processing, having the ISO 22000/HACCP certifications, as well as the EcoCert International Bio certification. Among the finished products were: pasteurized morsels of meat in bouillon, brine or proper juice; snail meat soup; snail stew; Escargots Bourguignon; snail meat sausage; snail meat pate. Despite their auspicious start, they were able to function only two years after the plant installation, in 2008. The most important processing factory in Romania was declared bankrupt in 2010, and so were its shareholders too.
The other two processing factories, the only ones active at this moment in Romania, are responsible with the processing of the entire amount of exported snails, most of them collected in the wild, and a small amount raised in the still surviving farms.

## CONCLUSIONS

The snail farming in Romania has disappeared, as quickly as it started. Whatever method did they use, the snail farmers have abandoned one by one this practice. The high mortality, the duration between investment and first benefits, as well as the marketing difficulties, have lead now to a collapse of this practice in Romania. In the south of Transylvania only two farms survived, one in Sibiu County, and a second in Hunedoara. Although many farms are not functional, they keep providing *H. pomatia* for the

processing factories, using their authorizations for farming, but actually collecting the snails from the wild, endangering the natural populations, and making impossible the control of the exploited amount. Despite the unfortunate experience, this new agricultural activity has the potential of a profitable practice in Romania, and especially in Transylvania, not just due to the European market demand, but also to the climatic conditions, which make possible the snail farming. Choosing the appropriate technology and species could allow the development of profitable businesses in the rural areas, which could serve as alternative to the exploitation of *Helix pomatia* natural populations.

## ACKNOWLEDGEMENTS

This work was cofinanced from the European Social Found through Sectoral Operational Progeamme Human Resources Development 2007-2013, project number POSDRU/89/1.5/S/63258 "Postdoctoral school for zootechnical biodiversity and food biotehnology based on the eco-economy and the bioeconomy required by eco-san-genesys"

## REFERENCES

BARKER G.M., (1982): Notes on the introduced terrestrial Pulmonata (Gastropoda:Mollusca) of New Zealand. Journal of Molluscan Studies, 48: 174–181.
BONNEMAIN B. (2005): Helix and Drugs: Snails for Western Health Care From Antiquity to the Present, *eCAM* ; 2 (1); pp 25–28.
DUHART, F. (2009): Snails and European Societies since the Antiquity. An Ethnozoological Essay, *STVDIVM. Revista de Humanidades, 15 (2009) ISSN: 1137-8417, pp. 115-139 (in Spanish)*
JUŘIČKOVÁ L., KAPOUNEK F. (2009): *Helix* (*Cornu*) *aspersa* (O.F. Müller, 1774) (Gastropoda: Helicidae) in the Czech Republic, *Malacol. Bohemoslov.* (2009), 8: 53–55.
KERNEY M.P., CAMERON R.A.D. JUNGBLUTH J.H., (1983): Die Landschnecken Nord- und Mitteleuropas. – Verlag Paul Parey, Hamburg und Berlin, 384 pp.
LUBELL, D.(2004): Prehistoric edible land snails in the circum-Mediterranean: the archaeological evidence, *Petits animaux et sociétés humaines. Du complément alimentaire aux ressources utilitaires,* XXIVe rencontres internationales d'archéologie et d'histoire d'Antibes Sous la direction de J.-P. Brugal et J. Desse Éditions APDCA, pp77-88.
MIENIS H.K., (2007): Verslag van een onderzoek naar het voorkomen van landslakken op de Afsluitdijk uitgevoerd in 1989 [A survey of the presence of terrestrial molluscs Afsluitdijk, the Netherlands, in 1989]. – De Kreukel, 43(8): 115–124 (in Dutch).
PICKERING J., (2009): Discover life. Worldwide web electronic publication. http://www.discoverlife.org/mp/ 20o?kind=Cornu+aspersum (14.9.2009)
PONS F, KOENIG M, MICHELOT R, MAYER M, FROSSARD N. (1999): The bronchorelaxant effect of helicidine, a *Helix pomatia* extract, interferes with prostaglandin E2. *Pathol Biol (Paris)*. Jan;47(1):73-80.
ROMANIA.Ministry of Agriculture and rural development, 15.01.2012: http://www.madr.ro/
ROMANIA.Payment Agency for Rural Dev. and Fishing, 15.01.2012: http://www.apdrp.ro/)
SANDERSON G., SIRGEL W., (2002): Helicidae as Pests in Australian and South African Grapevines. – In: Molluscs as crop pests, Barker G.M. (ed.), CAB International UK, London, pp. 255–270.
THIES, A, MOLL, I BERGER, J . SCHUMACHER U., (2001): Lectin binding to cutaneous malignant melanoma: HPA is associated with metastasis formation, *A British Journal of Cancer* , 84(6), 819–823.